OSA-AKM

Air Defence Missile System

Mission

The Osa-AKM air defence missile system is designed to protect ground troops in all kinds of combat operations, as well as installations from attacks of aircraft, helicopters, cruise missiles and unmanned aerial vehicles.

Osa-AKM is an autonomous self-propelled all-weather short-range ADMS. Each combat vehicle mounts radar, optical and computer systems, launching units with missiles, and power supply unit on the amphibious chassis. Their integration assures autonomous operation, including missile launches while on the move (one-two missiles against one target from a short halt).

Basic specifications	
Max target detection range, km	45
Target engagement envelope, km:	
range	1,5 - 10
altitude	0,025-5,0
Number of simultaneously tracked/engaged targets	1/1
Max target speed, m/s	up to 500
Reaction time, s	26 - 39
CV loading time, min	5
Missile launch weight, kg	127
Warhead weight, kg	15
Into/out-of-action time, min	up to 4

A group of combat vehicles can be controlled by means of existing control posts such as PU-12M7 and PPRU-M1.

Composition

- combat assets
- maintenance, support and training assets

The combat assets include:

- up to four 9A33BM3 (9A33BM2) CVs in one battery;
- up to six 9M33M3 (9M33M1) SAMs in the transporter-launcher containers on each CV.

The maintenance, support and training assets include:

- transporter/loader vehicle on amphibious wheeled chassis (up to 12 missiles);
- CV servicing and adjustment means, automated integrated missile test and monitoring, a group set of spare parts, tools and accessories, ground support equipment set;
- autonomous simulator for CV operators.

The Osa-AKM ADMS can be transported by any types of transportation means.

Modernisation programme

Modernisation of the Osa-AKM ADMS aims to increase combat and information capabilities of the system by introducing:

- telecoded datalink into the combat vehicle to automate control procedures, target designation data reception and two-way data exchange with the PU-12M7 or PPRU-M1 control posts at a distance of up to 5 km on the move and in station;
- Mk-X/Mk-XII IFF interrogator on the CV;
- TV/optical viewfinder with an electro-optical system based on low-light/thermal-imaging devices;
- SAM's warhead with 25% enhanced lethality;
- improvements of the crew's habitability conditions.

After minimal upgrading of the missile and combat vehicle equipment they can be used as the Saman aerial target system.

TOR-M1

Air Defence Missile System

Mission

The Tor-M1 air defence missile system is designed to protect ground troops and installations from attacks of air attack assets, especially precision-guided weapons, as well as fixed- and rotary-wing aircraft, cruise missiles and remotely piloted vehicles.

Basic specifications	
Max target detection range, km	25
Number of simultaneously detected and identified targets	48
Elevation of detected targets, deg	0 - 32 or 32 - 64
Number of simultaneously tracked target paths	10
Target engagement envelope, km:	
range	1.0 – 12
altitude	0.01 – 6.0
Number of simultaneously engaged targets	up to 2
Target speed, m/s	up to 700
Number of CV-mounted SAMs	8
SAM warhead weight, kg	14.8
Reaction time after target detection, sec	5 - 8
Max road speed, km/h	65
CV weight, t	37
Fuel endurance (with 2 hours of operation), km	500
Crew	4

The Tor-M1 is a state-of-the-art mobile all-weather short-range ADMS with radar, optical and computer systems, launchers, surface-to-air missiles and power supply units on board the combat vehicle. It can operate autonomously launching missiles on the move from short halts. The ADMS is highly immune to both active and passive ECM. Maximum automation of operation thanks to the use of a high-speed digital computer, coupled with the vertical launch and subsequent gas-dynamic declination (inclination) of the missile towards the target, ensure minimum reaction time possible.

Automated control for the Tor-M1 ADMS battery is provided by the 9S737M unified battery command post.

Composition

The Tor-M1 ADMS includes combat, technical and auxiliary assets.

Typical combat assets include:

- up to four 9A331-1 CVs with two SAM modules on each;
- 9M334 missile modules with four 9M331 missiles in each;
- 9S737M battery command post.

Technical assets include:

- maintenance assets for the ADM system and its vehicles;
- missiles loading/unloading, storage and transportation facilities with rigging equipment;
- ADMS group set of spare parts, tools and accessories.

Auxiliary assets comprise 9F678 self-contained simulator for CV operators.

Each CV is equipped with life-support equipment, navigation and mission recording means. The CV onboard equipment can be mounted on either tracked or wheeled chassis, or in container.

The Tor-M1 ADMS can be shipped by all transportation means, including aircraft.

STRELA-10M

Air Defence Missile System Modernisation

Basic specifications	
Night sight:	
target detection range, km	up to 10
spectral range of TI, μm	8-12
narrow/wide field of vision, deg	6 x 8/13 x 19
Engagement envelope, m:	
range	500-800 – 5,200
altitude (for 9M37MD, 9M333/9M37M1 SAMs)	10-3,500/25-3,500
Target speed, m/s	0-420
Target designation data reception mode	automatic with launcher turned towards the target
SAM guidance	passive optical seeker with two target and jamming channels
Weight of missile/missile with container, kg	41/72
SAM weight (9M37MD, 9M333/9M37M1), kg:	
rod warhead	5.0/3.5
high explosive	2.6/1.1
SAM fuse	impact/proximity laser, 8-beam

Mission

The Strela-10 short-range ADMS is designed to provide close air cover for ground forces in all types of combat operations and on the march, as well as to protect installations against low-altitude airborne threats, including fixed- and rotary-wing aircraft, cruise missiles, remotely piloted vehicles, under conditions of natural clutter and man-made optical (thermal) interferences by day and night, in restricted visibility conditions.

There are two modernisation options of the Strela-10 mobile short-range self-contained ADMS, namely: Strela-10M4 and Strela-10A (9A34A Gyurza). The upgraded systems can launch missiles from stationary positions, at short halts and on the move, both against approaching and receding targets.

For its deployment in restricted visibility/night conditions, the system is fitted with a new night sight with thermal imager and/or LLLTV camera.

Composition

- combat assets, including: 9A35M2(M3), 9A34M2(M3) or 9A35M (9A34M) combat vehicle upgraded to ensure automatic target designation data reception
- 9M37M1, 9M37MD, and 9M333 SAMs (four missiles per each CV)
- night sight

Maintenance and training assets are common both for the basic and modernised ADMS.

9A34A Gyurza modernisation option

Modernised Gyurza is distinguished from the basic system by the combat vehicle outfitted with all-round IR detection/acquisition system with digital computer, control and display panel. The Gyurza ADMS is operational round-the-clock, including nighttime.

The modernised Strela-10M Gyurza system features:

- automatic detection of aerial targets by day and night, beyond visual range;
- automatic selection of the most dangerous targets for engagement;
- fully automated pre-launch combat procedures;
- indication of tracked target paths and air target bearings;
- automated control of the launcher's actuators to guide SAM homing head on target;
- remote combat management of the battery combat vehicles from one of the CVs assigned as a commander's vehicle, or from a remote control panel at a distance of up to 300 m;
- display of technical status and operability of the CV onboard systems;
- centralised operation when remotely controlled from the command post.

Basic combat performance data and maintenance assets are identical to those of Strela-10M4 AMDS.

IR Target Acquisition System of the Strela-10M (9A34M Gyurza) ADMS	
Head-on/tail-on detection range, km	up to 10/20
Surveillance envelope, deg	
elevation	30
azimuth	360
Spectral range, μm	3 - 5